INVENTORY OF POLICY INTERVENTIONS – TANZANIA

DRAFT

POWER AFRICA TRANSACTIONS AND REFORMS PROGRAM (PATRP)

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The following draft report falls within the Policy Work Order (WO-17-US-03) of Power Africa/PATRP (PATRP Objective 4b).

This draft report was primarily generated by reviewing and analyzing published material on Tanzania's energy sector, a non-exhaustive list of which is included in the References section. In addition, the report draws upon, and incorporates the collective expertise provided by PATRP's in-country team and other technical advisory staff. In particular, the insights provided by the in-country team have ensured that any policy interventions that we have proposed are focused on removing barriers to advancing actual or prospective Power Africa transactions.

In its current draft form, this report represents a working document that will be shared, and discussed further, with USAID. Therefore, any policy interventions included herein are preliminary in nature. Upon further direction by USAID, our recommended policy interventions can be augmented and verified by means of in-country due diligence assessments.

This draft report was submitted for review to the Activity Manager leading the Power Africa Policy Work Order on 15 October 2015.

Report Compilation Team

Author	Jairo Guiterrez
Gender section author	Karen Stefiszyn
Appendix A author	Steve Wasira
Editor	Wynne Cougill
Review panel	Anton Eberhard, Ria Govender, Steve Wasira
Research assistants	David Jones, Thomas Herbert, Amé Viljoen
Work order team lead	Ria Govender
Work order supervisor	Llyr Rowlands

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ACRONYMS

Acronym	Definition
AfDB	African Development Bank
AU	African Union
BRN	Big Results Now (initiative)
CIDA	Canadian International Development Agency
COSS	Cost of Service Study
DFI	Development Finance Institution
DFID	Department for International Development (UK)
DOE	Department of Energy
DOS	Department of State
DPs	Development Partners
DPG	Development Partners Group
EAPP	East African Power Pool
EDCF	Economic Development Co-operation Fund (Korea)
EIA	Environmental Impact Assessment
EIPC	Electricity Infrastructure Procurement Coordinator
EPP	Emergency Power Producer
ESI	Electricity Supply Industry
EU	European Union
EWURA	Energy and Water Utilities Regulatory Authority
EX-IM	Export-Import Bank of the United States
FIT	Feed-in Tariff
GiZ	German Federal Enterprise for International Cooperation
GoT	Government of Tanzania
GW	Gigawatt
IPP	Independent Power Producer
ISO	Independent System Operator
JESR	Joint Energy Sector Review
JICA	Japan International Cooperation Agency
KfW	German (Government) Development Bank
kV	Kilovolts
kVA	Kilovolt-ampere
LTPP	(Tanzanian) Long-Term Perspective Plan
M&E	Monitoring and Evaluation
MCC	Millennium Challenge Corporation
MEM	Ministry of Energy and Minerals

Acronym	Definition
MoF	Ministry of Finance
MoU	Memorandum of Understanding
MoW	Ministry of Water
MW	Megawatt
NEMC	National Environmental Management Council
NEP	National Energy Policy
NORAD	Norwegian Agency for Development Corporation
ORE	Off-grid Renewable Energy
PA	Power Africa
PATRP	Power Africa Transactions and Reforms Program
PPA	Power Purchase Agreement
PPP	Public Private Partnership
PSMP	Power Sector Master Plan
REA	Rural Electrification Agency
RFP	Request for Proposal
SAPP	Southern African Power Pool
SEA	Strategic Environmental Assessment
SIDA	Swedish International Development Agency
SNV	Netherlands Development Organization
SPP	Small Power Producer
SREP	Scaling-Up Renewable Energy Program
TANESCO	Tanzania Electric Supply Company Limited
TASF	Transaction Advisory Services Facility
ToR	Terms of Reference
TEDAP	Tanzanian Energy Development and Access Project
TGDC	Tanzanian Geothermal Development Company
TPDC	Tanzania Petroleum Development Corporation
TSO	Transmission System Operator
USAID	United States Agency for International Development
USAID-DCA	USAID Development Credit Authority
USTDA	US Trade and Development Agency (USTDA)
UN	United Nations
ZECO	Zanzibar Electricity Company

EXECUTIVE SUMMARY

Tanzania has a comprehensive set of policies and laws to govern the energy sector. The National Energy Policy 2003 (NEP 2003) is the overarching policy for all energy subsectors, including the electricity subsector and is currently in the process of being updated. A draft was released for public comment in early 2015. The Government of Tanzania (GoT) is trying to harmonize the NEP 2003 with other national and sectoral plans, policies and legislation that were put in place since its enactment.

Although existing policies and laws have generally covered many of the elements needed to support investments in cleaner power generation and broader access to electricity, there are still significant policy gaps, and a number of legal, regulatory and institutional constraints that must be resolved, including those summarized below and included in Table 1:

- Fragmentation/misalignment of institutional roles due to a lack of harmonized policies and laws; this affects institutional operational capacity, tariff setting, power sector planning, procurement roles and responsibilities, and electrification plans
- Gaps in policy/legislation on biomass, large renewable energy projects, geothermal, subsidies, and energy efficiency programs
- Issues affecting Tanzania Electric Supply Company's (TANESCO) technical and financial performance: the need for cost-reflective tariffs, capacity for power planning, and the effects of non-transparent procurements
- Issues for facilitating independent power producers (IPPs): procurement procedures/open international bidding, adequacy of public private partnerships (PPPs) for IPPs, environmental compliance, and developer financing.

The main recommendations for technical assistance include: (i) enhancing tariff capabilities within the Energy and Water Utilities Regulatory Authority (EWURA), (ii) introducing new capabilities at EWURA in response to sector reform, (iii) establishing and starting up the Electricity Infrastructure Procurement Coordinator (EIPC), as described in the Electricity Supply Industry Reform Roadmap, especially with capacity to issue competitive procurements and associated procurement documentation and (iv) instituting systems and capability with the GoT to gather and organize sector data to support sound, strategic integrated power sector planning. These recommendations are summarized in Table 1 below.

TABLE 1: RECOMMENDED POLICY INTERVENTIONS

To Enable or Increase Private Sector Investment in Cleaner Power Generation and Widen Access to Electricity

Area of Focus	Barriers	Associated Principles	Recommended Intervention(s) Prioritized by Impact	Effect of Intervention	Technical Assistance Required
Energy policies	Lack of clarity around competitive bidding and inadequate treatment in updated energy policy on subsidies, large scale renewable energy including biomass and geothermal energy Overlapping institutional roles and mandates with regards to procurement of new power and rural electrification	Increased clean energy share	Enhancement and completion of updated National Energy Policy to respond to these barriers and gaps and, where appropriate development of subsidiary or subsector policies	More comprehensive and effective National Energy Policy that strengthens the enabling environment for cleaner energy and private investment and clarifies institutional roles and responsibilities	Development of proposals and assistance for MEM to strengthen and complete National Energy Policy through more clarification of roles and responsibilities (particularly with regard to competitive procurement) and also more comprehensive treatment of subsidy policy, and large-scale renewable energy including geothermal. Or, where appropriate assistance to MEM in developing stand-alone subsidiary or sub-sector policy documents
Energy policies	Lack of national policy on subsidies to and within the electricity subsector	Strong, transparent legal and regulatory frameworks	Issue complete national policy on subsidies to and within the electricity subsector	Transparent and explicit subsidy mechanism	Conduct an assessment and draft appropriate national subsidy policy (perhaps as a separate document or as part of the new energy policy)

TABLE 1: RECOMMENDED POLICY INTERVENTIONS

To Enable or Increase Private Sector Investment in Cleaner Power Generation and Widen Access to Electricity

Area of Focus	Barriers	Associated Principles	Recommended Intervention(s) Prioritized by Impact	Effect of Intervention	Technical Assistance Required
Energy policies	Lack of policy on renewable energy plants larger than 10 MW	Strong, transparent legal and regulatory frameworks Increased clean energy share	Issue renewable energy policy	Improved renewable energy investment environment	Conduct an assessment and draft renewable energy development policy defining rules and guidelines, standards, compliance enforcement (perhaps as a separate document or as a part of the new energy policy)
Energy policies	Lack of national biomass energy policy and strategy	Strong, transparent legal and regulatory frameworks Increased clean energy share	Issue national biomass energy policy	Improved renewable energy investment environment Set guidelines for sustainable use of biomass through modern technology while minimizing environmental degradation	Assess ongoing effort to draft and secure approval of policy on biomass and bio-fuel resources as energy resources (perhaps as a separate document or as a part of the new energy policy)

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To Enable or Increase Private Sector Investment in Cleaner Power Generation and Widen Access to Electricity

Area of Focus	Barriers	Associated Principles	Recommended Intervention(s) Prioritized by Impact	Effect of Intervention	Technical Assistance Required
Energy policies	Lack of national energy efficiency policy	Technical and commercial efficiency	Issue complete national energy efficiency policy to identify opportunities for overall energy efficiency gains, demand-side management, and peak load optimization	Improved energy efficiency investment environment and more efficient use of energy	Carry out a detailed assessment and draft appropriate national energy efficiency policy.
Energy laws	Lack of legal and regulatory framework for geothermal exploration and development	Strong, transparent legal and regulatory frameworks Increased clean energy share	Draft national law on geothermal exploration and development	Improved renewable energy investment environment and cleaner generation mix	Assist GoT and National Geothermal Task Force to draft national geothermal law

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To Enable or Increase Private Sector Investment in Cleaner Power Generation and Widen Access to Electricity

Area of Focus	Barriers	Associated Principles	Recommended Intervention(s) Prioritized by Impact	Effect of Intervention	Technical Assistance Required
Energy regulatory framework and tariffs	Lack of cost-reflective tariffs and credit-worthiness of TANESCO	Strong, transparent legal and regulatory frameworks	Strengthen capacity in EWURA in economic regulation	Cost-reflective tariffs and improved TANESCO financial sustainability and more credit-worthy off-taker for IPPs	Assistance to EWURA and TANESCO to reconcile views on cost-reflective tariffs Assistance to EWURA to strengthen its economic regulatory capabilities in response to requirements introduced by the unbundling of the sector according to the Sector Reform Plan and Roadmap

TABLE 1: RECOMMENDED POLICY INTERVENTIONS

To Enable or Increase Private Sector Investment in Cleaner Power Generation and Widen Access to Electricity

Area of Focus	Barriers	Associated Principles	Recommended Intervention(s) Prioritized by Impact	Effect of Intervention	Technical Assistance Required
Energy regulatory framework and tariffs	Lack of incentives for private micro-grid owner	Sound, strategic and integrated power sector planning	EWURA should establish a policy of compensation to the micro-grid owner for unamortized assets if the micro-grid is integrated into the grid and establish detailed procedures for addressing investor risk if areas with isolated mini-grids are electrified by the grid sooner than expected in long-term plans published or announced by the Rural Electrification Agency (REA)	Mitigates the risk of a private micro-grid owner incurring losses in the event the national grid is extended in the short or medium term	Regulator support in establishing policies and technical standards for micro-grids for their future integration into the grid

TABLE 1: RECOMMENDED POLICY INTERVENTIONS

To Enable or Increase Private Sector Investment in Cleaner Power Generation and Widen Access to Electricity

Area of Focus	Barriers	Associated Principles	Recommended Intervention(s) Prioritized by Impact	Effect of Intervention	Technical Assistance Required
Power sector development plans/integrated resource plans/generation master plans	Inadequate capacity to carry out integrated energy planning that includes all potential energy sources, including renewable energy, and considers transmission constraints	Sound, strategic and integrated power sector planning Increased clean energy share Strong regional power pools	Institutionalize integrated resource planning as the main energy sector approach using a revamped power sector master plan	Improved energy sector planning Established reliable sector databases Improved linkages with other sectors Improved links to timely initiation of competitive procurement for new power generation capacity	Ensure that the ongoing integrated resource planning effort is completed, disseminated and established as the approach moving forward Gather and organize sector data and put in place the systems needed to support integrated resource planning Conduct capacity building activities

TABLE 1: RECOMMENDED POLICY INTERVENTIONS

To Enable or Increase Private Sector Investment in Cleaner Power Generation and Widen Access to Electricity

Area of Focus	Barriers	Associated Principles	Recommended Intervention(s) Prioritized by Impact	Effect of Intervention	Technical Assistance Required
Power generation procurement framework and processes	Competitive bidding in power generation bypassed	Clear and transparent procurement processes	Reduce GoT practice of entertaining unsolicited proposals Enforce practice that all solicited and unsolicited bids go through a competitive bidding process	Timely, international competitive bidding in the procurement of investment opportunities in power generation and the avoidance of costly unsolicited bids and directly negotiated contracts for emergency or temporary power	Capacitate the Electricity Infrastructure Procurement Coordinator (EIPC) and assistance in developing procurement systems and standard documentation and contracts. Review EWURA's Initiation of Power Procurement Rules and Standard PPAs to check whether they adequately support competitive procurement. Evaluate whether PPP regulations issued by the PPP Center under the Public Private Partnership Act of 2014 inhibit effective IPP competitive bidding (by being too restrictive and cumbersome) and whether the requirement for state participation and TANESCO ownership could be waived

TABLE 1: RECOMMENDED POLICY INTERVENTIONS

To Enable or Increase Private Sector Investment in Cleaner Power Generation and Widen Access to Electricity

Area of Focus	Barriers	Associated Principles	Recommended Intervention(s) Prioritized by Impact	Effect of Intervention	Technical Assistance Required
Power generation procurement framework and processes	Unclear small power producer (SPP) regulations regarding land access, environmental permission and water use	Strong, transparent legal and regulatory frameworks	Establish regulations for SPPs associated with land access, environmental permission and water use	Increased SSP development	Assessment of technical assistance needs, particularly at the environmental regulator and water basin authorities
Electrification targets, planning and execution (for grid and off-grid)	Lack of creditworthy off-taker	Creditworthy off-takers Universal electricity access, achieved through the strategic use of on-grid, off-grid, and small-scale solutions	Establish a payment security mechanism at TANESCO for off-grid SPPs	TANESCO payment structure improved for prioritizing payments to SPPs	Conduct an assessment of the proposed payment mechanism
Electrification targets, planning and execution (for grid and off-grid)	Complex and restricted project development process	Streamlined and transparent processes for project development	Scale up project development through a bundled development approach	Will allow developers to get all approvals in place (currently, this is an arduous task for local developers that lack previous experience in this, in preparing feasibility studies, or in securing financial close)	Support the Transaction Advisory Services Facility (TASF) overseen by REA, which is being set up with the support of the World Bank

TABLE 1: RECOMMENDED POLICY INTERVENTIONS

To Enable or Increase Private Sector Investment in Cleaner Power Generation and Widen Access to Electricity

Area of Focus	Barriers	Associated Principles	Recommended Intervention(s) Prioritized by Impact	Effect of Intervention	Technical Assistance Required
Gender equality and female empowerment	It is assumed that there is insufficient capacity to implement gender-sensitive policy provisions	Gender equality and female empowerment	Gender mainstreaming capacity building (government partners) and promotion of women's participation in training and development activities	Strengthened implementation of NEP with respect to gender issues and increased women's participation in the sector	Gender mainstreaming workshop(s), resources and promotion of women in the sector through the Women in African Power Network

1. PROFILE OF TANZANIA'S ENERGY SECTOR

1.1 GENERATION CAPACITY AND MIX

Tanzania has an installed generation capacity of about 1450 MW, as shown in Table 2, including TANESCO's own generation of about 960 MW and about 490 MW from IPPs (including emergency power producers (EPPs)). Approximately 30% of the country's generation mix is hydropower, 40% is natural gas, and 30% is fuel oil and biomass.

TABLE 2: INSTALLED GENERATING CAPACITY IN TANZANIA

TANESCO Plant Name	Type	Installed Capacity Dec 2014 (MW) - TANESCO 2015 Business Plan
Ubungo 1-2	Natural gas	207.0
Tegeta GT	Natural gas	45.0
All Off-grid	Natural gas	25.5
Dodoma	Diesel/HFO	7.4
Nyakato	Diesel/HFO	63.0
All Off-grid	Diesel/HFO	50.9
Mtera	Hydro	80.0
Kidatu	Hydro	204.0
Hale	Hydro	21.0
Kihansi	Hydro	180.0
Pangani Falls	Hydro	68.0
Nyumba Ya Mungu	Hydro	8.0
Uwemba	Hydro	0.8
TANESCO - sub total		**960.7**

IPP / EPP Plant Name	Type	Installed Capacity May 2013 (MW) - Power System Master Plan
Songas 1-3 (Natural gas)	Natural gas	202.0
Symbion Ubungo (Natural gas)	Natural gas	112.0
Tegeta IPTL (Diesel/HFO)	Diesel/HFO	103.0
Aggreko Ubungo (Diesel/HFO)	Diesel/HFO	50.0
Mwenga (Hydro)	Hydro	4.0
TPC (Biomass)	Biomass	17.0
TANWAT (Biomass)	Biomass	2.7
IPP sub total		**490.7**

TANESCO + IPPs		**1451.4**
Natural gas sub total	**30%**	591.5
Diesel/HFO sub total	**40%**	788.7
Hydro sub total	**29%**	565.8
Biomass sub total	**1%**	19.7

Source: Government of Tanzania, *Power System Master Plan and TANESCO Business Plan 2015*.[1]

At their peak, EPPs represented 20% of Tanzania's generation capacity. Today, this has been reduced to 11% (162 MW – Aggreko Ubungo and Symbion Ubungo) with the decommissioning of three EPP plants (155 MW – Aggreko Tegeta, Symbion Dodoma and Symbion Arusha). EPP contracts were slated for rapid decommissioning due to the high financial burden they placed on TANESCO. These contracts were originally signed due to a long run of medium to severe droughts that significantly reduced hydro generation, forcing TANESCO to shed important portions of its load each year and to look for alternative suppliers of energy.

Shortfalls in generation capacity and the need to enter into high-cost EPP contracts stem from insufficient energy sector planning and opaque and hasty procurements that have taken place outside of the prescribed frameworks. These issues are expanded upon in Sections 2.4 and 2.5.

Upcoming additions to Tanzania's generation capacity are driven in large part by the Big Results Now initiative, which has fast tracked 1300 MW of generation projects to be completed by the end of 2016, however it is unlikely that these targets will be met.[2]

[1] The author and review panel have noted the errors of arithmetic in Table 2.

[2] Government of Tanzania, *Big Results Now Annual Report 2013/2014*.

1.2 ELECTRICITY ACCESS LEVEL AND TARGETS

Tanzania's low electrification ratio has remained a hurdle for economic growth. At the end of 2010 overall access was reported as 15%, as indicated in Table 3, with rural access as low as 4%. Clear efforts to increase these electricity access levels are still ongoing and are part of the strategic objectives of the Government of Tanzania (GoT). According to TANESCO, by 2013 about 18% of the households in mainland Tanzania had been electrified. In urban areas, the percentage was about 45% and in rural areas somewhat below 6%.

TABLE 3: ELECTRICITY ACCESS IN TANZANIA

Year	Access indicators
2010 (historic)	Overall access: 14.8% (1) Urban access: 46% (1) Rural access: 4% (1) Access deficit: 38.2 million people (2)
2015 (target)	Overall access: 30%
2025 (target)	Overall access: 50%
2035 (target)	Overall access: 75%

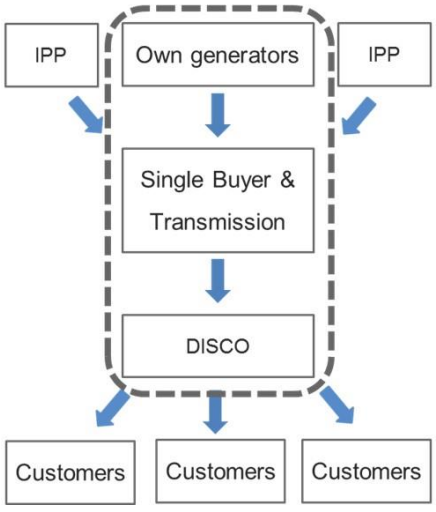
Main Source: Government of Tanzania, Ministry of Energy and Minerals, 2014
(1) SE4ALL, 2013
(2) World Bank, 2014

Increased access to electricity in rural Tanzania will continue to depend, in the short and medium terms, on TANESCO'S own budget, GoT subsidies, and development partners (SIDA, NORAD, World Bank, JICA, European Union, AfDB, etc.). Despite the existence of a Rural Energy Agency (REA) and a National Electrification Investment Prospectus for rural electrification, the misalignment of electrification strategies between the REA and TANESCO, as well as high costs, remain the principal barriers to increasing access rates. These issues are explored in Section 2.6.

1.3 POWER MARKET STRUCTURE, INCLUDING IPP PARTICIPATION

Today's power sector still reflects the main traits of a vertically integrated company under the single buyer model, as illustrated in Figure 1. Under this model TANESCO is the central entity that aggregates load, procures energy from all generators, allocates energy to the distribution company, collects all payments from the distribution company and pays all the generators.

FIGURE 1: BASIC STRUCTURE OF A VERTICALLY INTEGRATED UTILITY



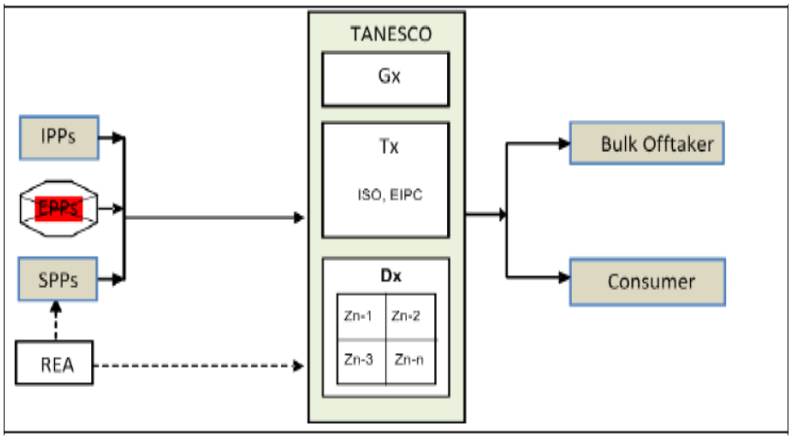
Independent power producers (IPPs) are important players selling their energy to the single buyer under long-term power purchase agreements (PPAs).

TANESCO's ongoing turnaround efforts are framed under the Electricity Supply Industry (ESI) Reform Strategy and Roadmap 2014 which called for a transition to a target market structure by the middle of 2015, as shown in Figure 1, and represents the following major reforms:

- Phase out reliance on EPPs, improving TANESCO's financial viability. According to TANESCO's managing director, as of July 2015, about 155 MW of EPPs have been decommissioned and only about 162 MW of EPPs are still operational.
- Ring fence TANESCO's generation, transmission and distribution practices, in anticipation of eventual vertical unbundling. Progress has been made with the initiative, focused on the configuration of the transmission system operator (TSO), which started in mid-2015. TANESCO has formed a steering committee and several internal working groups to interface with the consultants that have been engaged to carry out this assignment.
- Ring fence TANESCO's distribution practice into seven zonal offices, in anticipation of eventual horizontal unbundling. No significant results or efforts to achieve this are evident at this point.
- Establish an electricity infrastructure procurement coordinator (EIPC) and designate TANESCO as the independent system operator (ISO). According to TANESCO's managing director, as of July 2015, a concept paper has been prepared for establishing the EIPC. No additional results or efforts are evident at this point.

The transformation of Tanzania's electricity sector, as envisaged in the ESI Reform and Roadmap (Figure 2), will result in a competitive power market characterized by high levels of private sector investment in IPPs. IPP participation will be highly dependent on the implementation of Tanzania's PPP law, and adherence to transparent procurement processes. These two issues are more fully described in Sections 2.2 and 2.5.

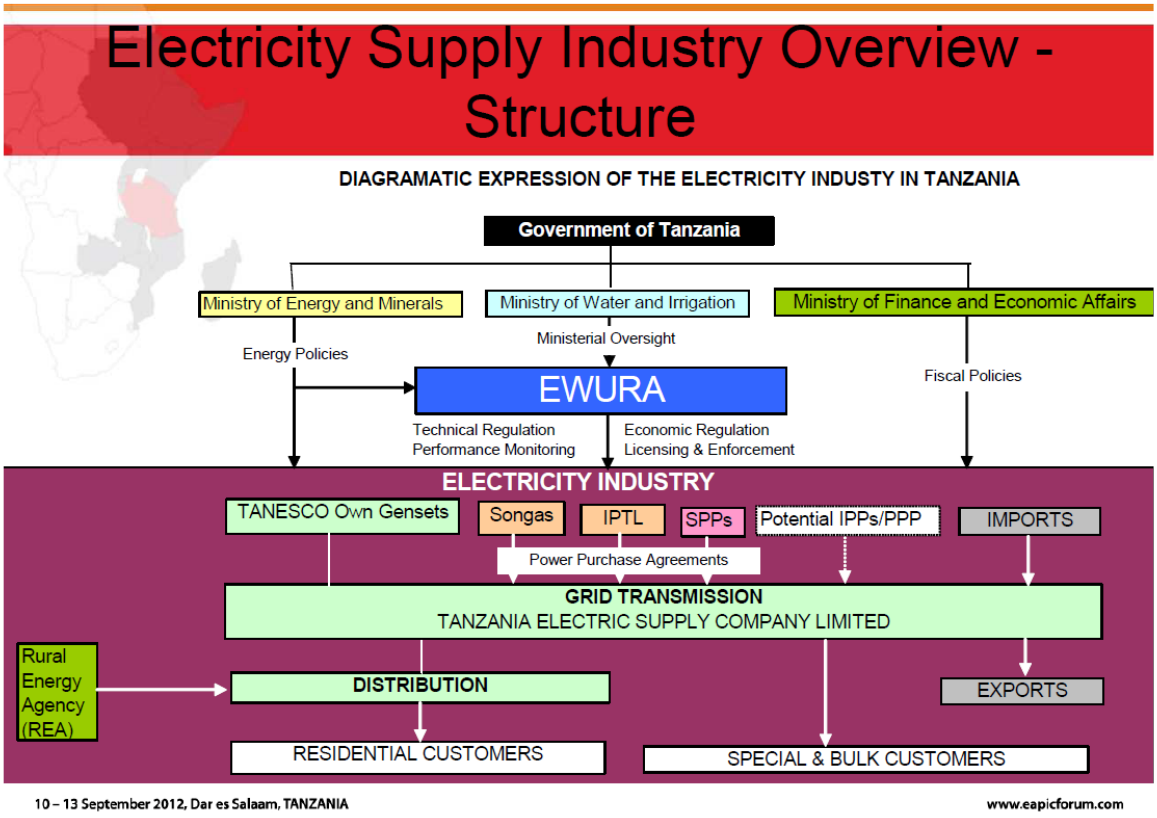
FIGURE 2: ESI REFORM TRANSITIONAL MARKET STRUCTURE



1.4 KEY SECTOR INSTITUTIONS AND MANDATES

The institutional framework for the governance and planning of Tanzania's electricity sector is built around a number of laws and national policies, as outlined in Sections 2.1 and 2.2. These policies define the responsibilities and levels of authority for the sector's institutions, chief among them the Ministry of Energy and Minerals (MEM), the Energy and Water Utilities Regulatory Authority (EWURA) and TANESCO. A general outline of this framework is presented in Figure 3.

FIGURE 3: INSTITUTIONAL STRUCTURE OF TANZANIA'S ELECTRICITY INDUSTRY



Source: Chibulunje, 2012.

The Ministry of Energy and Minerals (MEM) is mandated to develop energy and mineral resources and manage the energy sector. MEM is responsible for the formulation and articulation of policies to create an enabling environment for stakeholders in the sector, and provides policy guidance to various institutions including TANESCO, TPDC, REA, and EWURA, and private companies. MEM is also supervising the ESI reform process.

Tanzania Electricity Supply Company (TANESCO) the state-owned company, is mandated to develop and maintain power generation, transmission and distribution facilities in mainland Tanzania. TANESCO is managed by a nine-member Board of Directors that, under the provisions of the Public Corporations Act 1992, are appointed by the minister, and the president appoints the chair of the Board, in consultation with the minister.

Zanzibar Electricity Company (ZECO) is responsible for electricity supply on the island of Zanzibar. With no generation capacity of its own, ZECO pays TANESCO to import power from the mainland.

Rural Energy Agency (REA) a semi-autonomous body under the MEM, promotes access to modern energy services in rural areas of mainland Tanzania.

Energy and Water Utilities Regulatory Authority (EWURA) an independent regulatory authority organized under the Ministry of Water, has the mandates to, among others, issue licenses, review tariffs, monitoring, and technical standards.

Tanzania Petroleum Development Agency (TPDC) has the mandate to participate and engage in the exploration, development, production and distribution of oil and gas and related services; facilitate a fair trading environment; and safeguard the national supply of petroleum products.

National Environmental Management Council (NEMC) is the national institution whose mandate includes preparing and recommending terms and conditions for the approval or disapproval and/or issuance of environmental impact assessment certificates by the minister responsible for the environment.

There are a number of additional ministers directly responsible for different sectors, three of whom influence the energy sector:

The Ministry of Water (MoW) has the mandate to govern and oversee the utilization of available water resources and coordinate between power production and irrigation.

The Ministry of Finance is to develop the final budget for all state-owned investment projects, including energy sector projects financed by foreign loans and grants.

Ministry of Lands, Housing and Human Settlement is to implement the land acquisition Act of 1967 and has the authority to process the acquisition and initiate the valuation for compensation for land in connection with the construction of public infrastructure projects.

While Tanzania's electricity sector is generally well defined, there are examples of overlapping responsibilities, institutional overreach and misalignment of key procedures and frameworks for tariff setting, generation procurement and rural electrification. These issues are described in Sections 2.3, 2.5 and 2.6, respectively.

1.5 STATE OF THE UTILITY

TANESCO has been operating at a gross loss for at least the past five years (Table 4). The main factors contributing to these losses include: insufficient cash revenue from tariffs, high technical and commercial losses (18% in 2014), high staff costs, and a dependence on high-cost EPPs (a result of procurements made in the wake of a long drought that decreased hydropower capacity).

TABLE 4: TANESCO FINANCIALS

	2013	2012	2011	2010	2009
	TZS (M)	TZS (M)	TZS (M)	TZS (M)	TZS (M)
Revenue	933,525	820,436	545,658	466,477	413,501
Cost of sales	(1,417,515)	(1,162,437)	(753,397)	(492,252)	(439,124)
Loss before tax	(467,704)	(224,083)	(76,211)	(43,929)	(36,629)

Source: The Controller and Auditor General, *Financial Statements of Tanzania Electric Supply Company*. (2013).

A comparison of revenues and cost of sales is an indicator of TANESCO's central problem: revenues do not cover the cost of production and power purchases. Therefore, TANESCO has insufficient cash to cover all its operating costs. These circumstances forced TANESCO to increase its debt, as well as its dependency on GoT subsidies and donor grants and loans. It also ended up failing to pay power

suppliers in full as well as other suppliers. The low creditworthiness of TANESCO is a weakness that discourages investors.

For private investment to occur in Tanzania's power sector, investors and their lenders will need to be satisfied that their investments are safe and that they will receive a fair return on their investments. These private parties will require that the counterparty to their investment is a financially sustainable organization, a creditworthy off-taker of the power, and is likely to remain financially solvent and creditworthy over the full term of the power purchase agreement.

As the sector evolved into a new market structure in the early 1990s, private investors were allowed to build IPP generation plants and sell their output to TANESCO under long-term contracts. TANESCO's cost structure was adversely affected by those developments. The MEM's poor procurement practices (unsolicited bids and emergency temporary contracts) burdened TANESCO with high power purchase costs. Financial losses mounted, even though tariffs were being increased. The last electricity tariff increment (an average of 40% in January 2014) had only a limited direct impact on TANESCO's revenues as the utility has been adding tens of thousands of new low-use (low paying) customers, which creates social and political benefits but is not necessarily a financially productive strategy for an already cash-strapped and loss-making utility.

The utility's management is in the middle of implementing a business plan to turnaround TANESCO and seeks to invest in increased generation capacity (mostly financed through funding from development partners and IPPs and PPPs as shown in Table 5). This is a highly visible and strategic effort framed under Tanzania's ongoing ESI Reform Strategy and Roadmap, which details specific reform initiatives and key steps that the GoT, through the MEM, intends to follow to improve reliability, affordability, and accessibility of electricity supply. An examination of this effort, and specific analysis of tariff-setting rules, generation plans, procurement procedures and rural electrification, as they relate to TANESCO's operational objectives and financial viability, are discussed in Sections 2.3, 2.4, 2.5 and 2.6, respectively.

TABLE 5: SOURCES OF FUNDING FOR NEW TANESCO POWER PLANTS

S/NO	Project Description	Funding Source	Project Cost	Status	Completion Date
1	Kinyerezi I – 150 MW gas-fired power plant	GoT	US $183 million	Construction 99% completed	September 2015
2	Kinyerezi II – 240 MW gas-fired power plant	GoT: 15% JBIC: 85% Contractor: Sumitomo Corporation	US $344 million	Financial closure achieved. GoT contributed 15%	2017
3	Kinyerezi III – 600 MW gas-fired power plant	China Power Investment	US $401 million	Joint venture company formed and feasibility study is under review	2017
4	Kinyerezi IV – 330 MW gas-fired power plant	Poly Technology Inc. of China	US $300 million	Preliminary feasibility study is under review	2017
5	Somonga Fungu – 320 MW gas-fired power plant	Kilwa Energy IPP	US $365.6 million	Financial closure in August 2015	2017

TABLE 5: SOURCES OF FUNDING FOR NEW TANESCO POWER PLANTS					
S/NO	Project Description	Funding Source	Project Cost	Status	Completion Date
6	GeoWind – 50 MW wind power plant at Singida	ExIm Bank of China	US $136 million	Discussions to conclude financial closure are progressing	2017
7	400 MW gas-fired power plant at Mtwara with M/S Symbion Power	Symbion	US $396.577 million	Feasibility study is under review	2018
8	87 MW hydropower plant to be developed at Kakono in Kagera Region	Not yet secured	US $379.4 million	Feasibility study is completed; financing is now being solicited	2019
9	44.8 MW hydropower plant to be developed at Malagarasi River in Kigoma	Not yet secured	US $149.5 million	Feasibility study is completed; financing is now being solicited	2020

Source: Mramba, *TANESCO Overview*, August 2015

2. TANZANIA'S ENERGY POLICY FRAMEWORK

The main policies and legislation relevant to the Tanzanian power sector are listed in Table 6 and some comments and observations are presented regarding their status and plans.

TABLE 6: POLICIES AND LAWS AFFECTING TANZANIA'S POWER SECTOR	
Policy / Legislation	Comments
General	
National Energy Policy 2003	In place, update drafted and under review since early 2015
Public-Private Partnership Policy	In place, formulated in 2009
Public-Private Partnership Act	Enacted in 2010 and amended in November 2014 to create the PPP Center as one-stop coordinating unit to assess the feasibility and viability of PPP projects, including financial risks and other financial issues prior to GoT funding.
Public Procurement Act 2011	In place
Environmental Policy 1997	In place
Environmental Management Act 2004	In place
National Climate Change Strategy 2012	In place
Climate Change Adaption Plan	June 2016 in MEM Strategic Plan
Climate Change Adaption Strategy	June 2016 in MEM Strategic Plan
MEM Environmental Action Plan 2011 - 2016	In place
National Environmental Action Plan 2013 - 2018	In place
Land Act 1999	In place
Land acquisition Act 1967	In place
Tanzania Development Vision 2025	In place
Tanzania Long-Term Perspective Plan (LTPP) 2011/12-2025/26	In place
Tanzania Five-Year Development Plan 2011/2012-2015/16	In place
Wildlife Policy Act 2009	In place
Forestry Act 2002	In place
Environmental Impact Assessment and Audit Regulations of 2005	In place
Electricity Sector	
Power Sector (Reform) Policy 2014	The Roadmap for Sector Reform was approved by the Cabinet and published on June 30, 2014.
Power System Master Plan May 2013 update	2012 update, dated May 2013. A new updated version is under development with support from JICA.
Electricity Act 2008	In place
Rural Energy Act 2005	In place
Big Results Now Initiative 2013	In place

TABLE 6: POLICIES AND LAWS AFFECTING TANZANIA'S POWER SECTOR	
Policy / Legislation	Comments
National Electrification Investment Prospectus 2014	National Electrification Program Prospectus prepared for REA with support from NORAD has been ready since July 2014 – basis for rural electrification plans
Renewable Energy Sector	
New Renewable Energy Policy	Draft terms of reference (ToR) for consultants finalized
Biofuels Policy	Drafted, to be finalized and submitted for approval
Biofuels Act	To follow the Biofuels Policy
Biomass Energy Policy and Strategy	Being drafted
Agro-Ecological Zoning	In process
Energy Conservation and Efficiency Policy	Part of possible SIDA assistance on energy efficiency program
Climate Change Adaption Plan	June 2016 in MEM Strategic Plan
Climate Change Adaption Strategy	June 2016 in MEM Strategic Plan
Guidelines for Sustainable Liquid Biofuels Development in Tanzania 2010	In place
Tariffs	
EWURA Act 2001	In place
Feed-in Tariff Policy	Consultancy study on FIT gave recommendations in 2014
Subsidy Policy	Included in BRN. To be drafted and published
Gas Sector	
Natural Gas Policy	Adopted 2013
Draft Natural Gas Act	Prepared 2014
Natural Gas Utilization Master Plan	Drafted, awaiting finalization and adoption
Petroleum Act 2015	In place
Oil and Gas Revenues Management Act 2015	In place
Tanzania Extractive Industry (Transparency and Accountability) Act 2015	In place

Source: Based on Ministry of Energy and Minerals (SIDA Funding), *Joint Energy Sector Review 2013/2014* and updates by the author.

2.1 ENERGY POLICIES

The Tanzania Development Vision 2025, published by the Planning Commission in 1999, established the framework and main strategy outlining the general development of the nation. This vision was further developed through the Tanzania Long-Term Perspective Plan (LTPP) 2011/12-2025/26, published in June 2012 and the Tanzania Five-Year Development Plan 2011/2012-2015/16, providing further details to achieve the goals in the Vision 2025 document.

It is within this framework that the GoT and MEM continue the development of an energy sector that supports those overall national goals, most recently through the ESI Reform Strategy and Roadmap 2014-25, and the Big Results Now (BRN) Initiative, an ambitious energy-sector-focused effort that aims at completing a list of 28 prioritized power projects by 2016. The progress and results of BRN are monitored by the highest authorities within the GoT and MEM.

While development plans and the BRN seek to accelerate progress towards Tanzania's power sector goals, the National Energy Policy 2003 (NEP 2003) is the overarching policy for all the energy

subsectors including electricity. During 2014, the MEM indicated that it was undertaking an update and review of the NEP 2003. The GoT is trying to harmonize the NEP 2003 with other national and sectoral plans, policies and legislation that were put in place since its enactment.

This update of the Energy Policy is considered important as it would facilitate moving forward with the various needed electricity sector updates, including: subsidies, tariffs, TANESCO turnaround/reform, geothermal and other renewable energies etc. This review has generated a draft document, which is expected to be completed later in 2015.

Although existing policies governing the power sector have generally covered most of the dimensions to support investment in cleaner power generation and greater access to electricity, there are still challenges and policy gaps, including pending actions that would directly address the following key areas:

- **National policy on subsidies to and within the electricity subsector.** An Energy Subsidy Policy is under development by the MEM in consultation with key stakeholders in the energy sector.
- **Renewable energy policy.** Specific policy and legislation for renewable energy development defining rules and guidelines, standards, compliance enforcement, etc.
- **National energy efficiency policy.** This policy will identify opportunities for overall energy efficiency gains, demand-side management and peak load optimization.
- **National biomass energy policy and strategy.** There is an ongoing effort to draft and approve an explicit policy to cover only biomass and bio-fuel as energy resources, recognizing the need to set guidelines for the sustainable use of biomass through modern technology and by minimizing environmental degradation.[3]

It is important to clarify that the draft energy policy released for comment in 2015 includes policy statements regarding subsidies, energy efficiency and renewable energy, although there is a need to develop these further.

In addition to these policy gaps, it is recognized that misalignments and overlaps in the mandates of various institutions lead to operational challenges that result in the suboptimal utilization of available resources within affected institutions, exacerbating problems seen in infrastructure procurement and power planning. These operational challenges include:

- Persistent funding constraints
- Inadequate human resource capacity
- Insufficient monitoring and evaluation (including indicators) to support policy implementation
- There is a perception that an energy research institute is needed to promote research and the development of appropriate energy technologies, encourage local capacity development, local equipment manufacturing and advanced training
- Insufficient publicly available data and information regarding energy resources.

It is also worth noting that in 2012, the GoT released a National Climate Change Strategy addressing both adaptation and mitigation, linking efforts with the country's vision for sustainable

[3]Biomass accounts for about 90% of the country's total energy consumption. Source: Kileo, *Policy, Legal and Institutional Framework for Petroleum Development in Tanzania*, 2015.

development. This is a step in the right direction, but no additional efforts or progress are evident at this point.

2.2 ENERGY LAWS

Over the last 15 years, Tanzania has taken important steps to create essential enabling conditions for the development of the overall energy sector and renewable energy resources in particular. In spite of all the legal achievements and efforts to make improvements to the regulatory and institutional framework, the GoT is still facing a number of challenges. Mirroring the operational issues that result from a fragmented energy policy, as described above, there are a number of constraints that must be resolved including a specific legal and regulatory framework for geothermal exploration and inadequate legal and regulatory provisions governing land acquisition and access for the energy sector.

In terms of the legal framework governing the participation of the private sector in power generation and related investment in the energy sector, the Public Private Partnership Act 2010 created the PPP Center as a one-stop coordinating unit to improve overall efficiency, coordination and management for PPP projects and to assess the feasibility and viability of PPP projects, including financial risks and other financial issues, prior to GoT funding and implementation. It is not yet clear whether this legislation will have the effect of slowing IPP developments through making approvals more complicated and whether it will be a requirement for IPPs to also have GoT investment and ownership.

Recently, the GoT enacted three pieces of legislation needed in the oil and gas sectors: the Petroleum Act 2015, the Oil and Gas Revenues Management Act 2015, and the Tanzania Extractive Industry (Transparency and Accountability) Act 2015. This legislation repeals the Petroleum (Exploration and Production) Act 1980, covering upstream petroleum operations, and the Petroleum Act 2008, covering mid- and down-stream petroleum supply operations.

In terms of environmental management, the Environmental Management Act of 2004 and the Environmental Impact Assessment and Audit Regulations of 2005 are the key pieces of legislation. There are other acts and regulations, such as the Land Act 1999, the Wildlife Policy Act 2009, and the Forest Act 2002, that complement these two main documents.

The Environmental Management Act gives the National Environmental Management Council (NEMC) mandates to undertake enforcement, compliance, review and monitoring of environmental impact assessments, conduct research, raise environmental awareness, and collect and disseminate environmental information. NEMC is also charged with recommending and preparing terms and conditions for the approval/disapproval and/or issuance of environmental impact assessment (EIA) certificates by the minister responsible for the environment.

2.3 ENERGY REGULATORY FRAMEWORK AND TARIFFS

In terms of the institutional and regulatory framework associated with EWURA, the president of the country appoints the chairperson of EWURA. The Minister of Energy has powers to give directions of a specific or general nature to EWURA and the five non-executive members are appointed by the minister responsible for EWURA after consultation with the relevant sector ministers. Members are appointed from a list of names proposed by the nomination committee, a committee established

under section 9 of Cap 414. Funding for EWURA is provided by fees collected for the granting and renewal of licenses, and levies collected from regulated suppliers. It is generally perceived that EWURA is quite autonomous but is still affected by political interests.

The GoT has publicly committed to improving TANESCO's viability through tariff reform, allowing for full cost-recovery and necessary operational improvements to the management of the utility. However, EWURA and TANESCO seem to use two separate approaches for tariff calculation.

EWURA's methodology and approach to revenue requirements is based mostly along the lines of a classic US-style cost-of-service approach which typically involves a regulated asset base plus an operational expenses approach with asset valuation using "new replacement value." Elements used by EWURA in that calculation come from the cost of service study (COSS) completed in 2013 by a Spanish consulting company that calls for a "model efficient firm" approach to setting allowable distribution cost levels.

TANESCO's tariff submission[4] does not include a description of a methodology, but it does include some tables presenting the calculation of annual revenue requirements. These calculations appear to be based on TANESCO's budget, instead of the cost of service methodology EWURA applies. TANESCO's calculation of "total revenue requirement" seems to be a calculation of cash needs plus depreciation.

Ultimately, EWURA should select and implement the tariff methodology that complies with the objectives and constraints established in the legislation, but there is need for EWURA to evaluate the impact on TANESCO of its tariff methodology in terms of TANESCO's ability to finance the investments required by GoT policy.

A result of this difference on what constitutes "cost-reflective tariffs" is that TANESCO may not be able to fully recover its costs. There is a need for EWURA and TANESCO to reconcile their differences, particularly with respect to the specific costs that EWURA expects to disallow. EWURA should also use opportunities to claw back TANESCO's costs in case they are not actually incurred.

Efforts to reconcile views on cost-reflective tariffs among EWURA, TANESCO and other stakeholders are ongoing and in August 2015, the National Association of Regulatory Utility Commissioners, with support from the United States Agency for International Development (USAID) carried out a workshop on cost reflective tariffs in Dar es Salaam.

Electricity tariffs are a key aspect to TANESCO's operation as they continue to lag in terms of adequate revenue generation. TANESCO has reported losses before taxes in each of the last five years. A comparison of revenues and cost of sales is an indicator of TANESCO's central problem: revenues do not cover the costs of production and power purchases.

In regards to renewable energy feed-in tariffs (FIT), EWURA made significant progress in 2013 by engaging a consultant to carry out the required study, which was finalized in late 2014. The study focused on specific technologies including mini-hydro, mini-grid connected solar and wind projects, and biomass both for the main grid and mini-grid SPPs. EWURA approved, in April 2015, the Second Generation Small Power Producers (SPP) Framework for Tanzania and published the 2015 SPP tariffs (calculated based on the avoided cost methodology) which are applicable starting for grid and off-

[4] TANESCO, *Tariff Review Application,* 2013.

grid connected SPPs. Under the Second Generation SPP Framework, FITs do not distinguish between SPPs located on the national grid or on mini-grids. Instead, the Second Generation SPP Framework provides fixed tariffs by size for hydro and biomass SPPs wherever they are located.

2.4 POWER SECTOR PLANNING

The Big Results Now (BRN) initiative has set key energy sector planning targets for Tanzania. By 2025, Tanzania is expected to have installed 10,000 MW, more than six times the present capacity, which would represent a radical departure from past supply shortages. In reality however, BRN has prioritized and promoted state-owned projects, and there is concern about slipping up on targets and timetables. Gas-to-power plants will make an increasing contribution to Tanzania's energy mix. Tanzania has discovered large off-shore natural gas resources in the south of the country and a large Chinese-funded pipeline is being constructed to bring the gas up to Dar es Salaam.

Also relevant is Tanzania's Power Sector Master Plan (PSMP) 2013, and the Rural Electrification Investment Prospectus 2014, financed by NORAD. The PSMP was created by a joint team of Tanzania's leading experts from across the energy sector with representatives from MEM, REA, TANESCO, Tanzania Petroleum Development Corporation (TPDC), EWURA, Ministry of Finance (MoF), and National Bureau of Statistics. Development partners were involved at the end of the process by providing comments to the draft PSMP. An updated version of the PSMP is under development with support from JICA and is expected to be finalized in 2015.

The PSMP makes recommendations on the prioritization of grid-connected thermal and hydro generation projects. Initial screening criteria excluded, for example, projects with final energy costs greater than USD 0.10/kWh, or capacities below 20 MW.[5] Furthermore, the PSMP did not consider SPP projects, transmission constraints or the expected impact of the Scaling-Up Renewable Energy Program (SREP) on renewable energy. Geothermal was excluded due to the uncertainty of the resource at the time.

Sector planning also centers on regional power trade. TANESCO and the GoT envision that once natural gas resources start supplying a growing generation capacity, Tanzania will become an important partner in regional electricity trade. Concrete initiatives are in place to interconnect with the national grids of Zambia and Kenya so that the three countries can exchange power under the Southern African Power Pool (SAPP) and East African Power Pool (EAPP).

However, it is generally recognized that the energy sector lacks an integrated energy planning approach which has been blamed for some of the shortages or disruptions in fossil fuel supplies, national power interruptions and power rationing.[6] Additionally, energy sector stakeholders have argued that the lack of integrated planning has also generated competing or conflicting interests regarding the development and utilization of energy resources. The Draft National Energy Policy 2015 indicates that the main challenges to establish proper integrated energy planning in Tanzania include:

- Inadequate capacity to carry out integrated energy planning

[5]Government of Tanzania, *Ministry of Energy and Minerals, Power System Master Plan 2012 Update*, May 2013.

[6]During 2014 there were three total power system failures that lasted over three hours each.

- Inadequate systems and information for generating integrated energy planning and monitoring its implementation
- Lack of petroleum and renewable energy master plans
- Lack of reliable data and information databases for basically all forms of energy
- Inadequate linkages with other sectors of the economy.

In terms of improving integrated resource planning, the only initiative was the engagement of a consulting company in 2014 to focus on the integration of an information management system for integrated resources planning.

It is also noted that the limited role of renewable energy in the PSMP reflects inadequate data availability and a lack of the power planning tools and methods needed to more effectively integrate renewable energy options in Tanzania's overall power sector development. This uncertainty regarding expansion planning and implementation also creates uncertainty in the development of mini-grid projects.

In terms of sector planning and development under the current situation, MEM is the responsible entity and "leads" the creation of the PSMP, with TANESCO (officially) doing the detailed calculations with input from other stakeholders, including, EWURA, TPDC, etc. TANESCO's Strategic Planning Department takes a significant role with the support of TANESCO's planning engineers and external consultants.

TANESCO has demonstrated that it can support technical aspects of carrying out demand forecast and generation modeling, but there is no evidence that it can carry out integrated system expansion considering both generation and transmission. The PSMP excluded transmission restrictions as it was assumed that the development partners working to expand the transmission system would be sufficient to support the network (for example, the 400 kV Backbone Project and associated works).

Regarding future power sector planning, it appears that the PSMP is expected to continue to guide sector investment planning (see Roadmap, Section 6.6.7). However, it is unclear who will have the responsibility for leading the PSMP process as the industry is restructured. Officially, the Electricity Act 2008 gives the responsibility to the ISO/TSO. In the short/medium-term, this question, together with a more detailed specification of how the role of centralized generation planning in an intended competitive generation environment will work, remains an issue to be resolved through the implementation of the sector restructuring process. This situation is part of the discussion mentioned earlier regarding the need to define, in theory and in practice, the roles of respective institutions in the sector.

In the short-term, there is a logic to MEM and TANESCO cooperating in planning activities as the utility probably has more technical capacity and can support MEM. However, TANESCOS's role should be clarified. It occupies a dominant position in the current power market structure: it is still involved in new power generation capacity and faces an obvious conflict of interest in planning processes that potentially allocate new build opportunities to IPPs. MEM will need to manage this situation so that rational decisions are made around when it makes sense for TANESCO to build and when IPPs.

There is also a need for the development of a strategic environmental assessment (SEA) that complements the PSMP.

2.5 POWER GENERATION PROCUREMENT FRAMEWORK AND PROCESSES

The Public Procurement Act, 2011 sets the rules and reporting requirements for procurements undertaken by all public institutions. Its intent is to require competitive public procurements in basically all instances, with the exceptions noted below, and to require regular reporting to the Public Procurement Regulatory Authority;

- Article 4 explicitly exempts "government-to-government" sponsored projects or international financial institution projects from the requirements of competitive procurement.
- Article 65 includes provisions for "emergency procurement" for which procedures could possibly bypass the normal competitive process. There are several safeguards in the Act (including, e.g., a requirement to seek approval from the Government Procurement Services Agency), which seem to avoid abuse of this provision.
- Article 80 addresses the issue of unsolicited PPP proposals by requiring that a PPP project resulting from an unsolicited proposal be subject to competitive tender, although the "intellectual rights over the project idea" held by the original proposer can be taken into consideration in the tendering process.

EWURA has some power to address problems created by the potential abuse of either the emergency procurement conditions or unsolicited IPP bids. This power, set out in Article 25 of the Electricity Act, gives EWURA the authority to void any contract not approved by the regulator. EWURA also has the legal mandate to approve the initiation of procurements of new power generation projects.

It is also important to note that the Public Private Partnerships (Amendment) Act of 2014 requires all solicited and unsolicited bids to go through a competitive bidding process, particularly for procurements of new energy projects, equipment, machinery and energy infrastructure in general. This amendment includes the establishment of a PPP national investment steering committee, technical committees, and a PPP facilitation fund. The PPP center will also enact procurement regulations with the purpose of ensuring an efficient procurement system.

As previously indicated in the section on utility performance, it appears that the new approach to procurement is to have all new IPPs developed as PPPs with TANESCO as a partner. Considering TANESCO's precarious financial situation, in the short term, this could potentially frustrate efforts to develop IPPs. [7]

Broadly speaking, it is generally perceived that past procurement processes have failed to produce the timely installation of power projects based on sound planning and competitive bidding initiatives. Lessons are clear from the MEM's signing of MOUs with unsolicited bids and entering non-transparent negotiations for mostly emergency or temporary plants. All stakeholders, including the GoT, recognize that this cycle needs to end by accepting that competitive tenders yield better price outcomes and, if properly managed, result in timely initiation of commercial operation of the generation projects.

One of the most common complaints about power generation procurement has been that PPA negotiations take too long and no standard PPAs were in place. As a result, EWURA was tasked to

[7] Mramba, *TANESCO Overview*, August 2015.

address this issue as one of the key milestones in the Electricity Sector Reform Strategy and Roadmap in June 2014. In August 2015, EWURA officially published the "Model Power Purchase Agreements" covering seven energy technologies to be used as guidance for projects larger than 10 MW (hydro, natural gas, oil, coal, geothermal, wind and solar). These model PPAs are separate from the standard PPAs already published and used by SPPs.

TANESCO has indicated that the private sector is increasingly looking for competitive bidding in the procurement of investment opportunities in power generation, transmission and distribution. A movement towards competitive procurement of power projects by the GoT should therefore be prioritized. It is generally accepted that TANESCO's financial problems are caused in part by the lack of competitive bidding methods that led to the signing of PPAs that were expensive and therefore there should be increased transparency and compliance with competitive procurement practices in the future.

2.6 ELECTRIFICATION TARGETS, PLANNING AND EXECUTION (FOR GRID AND OFF-GRID)

The GoT decided to undertake an ambitious rural electrification program, which includes both grid-based and off-grid approaches. The GoT's development partners have already provided support for rural electrification, and are interested in continuing their support for the government's future program. According to the Draft National Energy Policy 2015, the GoT plans to increase the connectivity level to 30% by the end of 2015, 50% by 2025, and at least 75% by 2033.

The GoT and its development partners have already taken several steps to facilitate and accelerate rural electrification. These include providing support to the REA and the development of the National Electrification Investment Prospectus for rural electrification. The prospectus, finalized in 2014, aims to advance electrification efficiently by guiding investment and development in the grid and off-grid energy sectors of rural, mainland Tanzania. The Prospectus recommended a specific methodology to be used for rural electrification planning, including the development of a "rolling" Master Plan. The methodology builds on the work done previously at a regional level by the EU and suggested a "geo-spatial least-cost electrification rollout" in order to prepare the Master Plan.

Support to the REA included the Tanzania Energy Development and Access Project (TEDAP), a five-year program that created several key elements of a facilitating framework for off-grid rural electrification programs in Tanzania. Operating under the REA, TEDAP ran from 2010 to March 2015, generating a set of lessons on scaling-up off-grid rural electrification; they are now being applied in the design of the follow-on program, a component of the World Banks's SREP.

Nevertheless, there are several barriers and gaps that are likely to hinder the plans for accelerated rural electrification.

Suboptimal Planning and Execution Process: The Prospectus stands out as a well-conceived plan; however, it is uncoordinated with TANESCO's plans in rural areas. Donors' grid expansion support activities in Tanzania have greatly accelerated rural access, while creating parallel activities to TANESCO's in the areas of expansion planning, project design, tendering, procurement, construction management, and monitoring. This has created a large potential for overlap with REA or poor execution. As funds have poured into the Rural Electrification Fund and REA's capacities have grown, TANESCO has struggled to keep up with the rapid growth in grid expansion projects while it is

maintaining and improving its own, ever-expanding operations. There is still poor coordination among implementers and a lack of clarity about what is being implemented and planned.

High Compliance Burden and Transaction Costs: Based on interactions with developers, discussions with the REA and other stakeholders, the greatest compliance burden comes from NEMC, which issues environmental clearances, and the River Basin Authorities, which issue water use approvals for mini-hydro and micro-hydro grids. The GoT perceives that reducing the compliance burden is a necessary task. It is clear that developers of off-grid projects have to comply with a large number of rules and regulations, and obtain many licenses and permissions. Hence, it is worthwhile to assess the extent to which the requirements of each necessary permission/license can be reduced by working with the permitting agencies.

A good example comes from a biomass developer looking to establish micro-grid systems across the country. Their biggest worry to date remains the environmental clearance. The installed capacity of the plants they are currently installing in off-grid communities is 40 KVA. They believe that they will have to repeat the environmental impact assessment process for every location in which they intend to install a biomass plant. For the first plant, they have spent about $12,000 to date on the process. Aside from this exorbitant cost (more than 20% percent of the cost of the system), they have spent more than 8 months waiting for the clearance. This means that they will have to spend a year before they can install a 40 KVA plant if they have to comply with this environmental regulation. This is the largest regulatory risk that the developer faces in Tanzania.

Developer Financial Barriers:

- **Equity**. One challenge faced by small-scale renewable power developers in Tanzania is the limited availability and access to private sources of investment capital. Many developers are challenged by their own limited equity, and they rely on public funding to complete their investments. It is difficult to obtain debt finance with low levels of equity. It is essential that there be smooth, workable channels by which private equity investments can flow into small, renewable power projects on terms acceptable to the investors as well as the local owners of the renewable resource. In Tanzania, such investments could be undertaken by pension funds, regional investment funds, high net-worth individuals, and listed equity investments. Or they may come from external sources that are interested in providing "patient" or social capital. At present, there is no framework for channeling equity into off-grid renewable energy (ORE) projects. Hence, there is an urgent need to develop such a framework.
- **Debt**. Apart from equity, investment in ORE will continue to need debt finance at reasonable rates.
- **Risk**. Discussions are underway to establish a risk mitigation facility that will be used to address TANESCO/off-taker late payment to small power producers.
- **Developers' lack of skills**. Some of the local resource owners/controllers who are interested in developing their resources for ORE do not have any experience with any type of investment projects. They also lack adequate experience/skills to develop, commission, and operate power generation and distribution projects.
- **Lack of economies of scale and scope**. The small scale of these projects, to be operated on an individual basis, indicates that there may be economies of scale and scope in developing and operating the projects, which are not being utilized under the current system. The options for taking advantage of economies of scale and scope need to be investigated, and, if found desirable, institutional mechanisms for exploiting them need to be developed.

3. TANZANIA'S POLICIES AND LAWS FROM A GENDER EQUALITY AND FEMALE EMPOWERMENT PERSPECTIVE

Tanzania has a National Strategy for Gender Development, which aims to mainstream gender in all policies, programs, plans, strategies, budgets, and activities to bridge the existing gaps at all levels. The Ministry of Community Development, Gender, and Children must support the Ministry of Energy and Minerals to apply the Gender Development Strategy to energy policy making and implementation.

The Tanzania Draft National Energy Policy (NEP) of 2015 includes a section on gender mainstreaming in the energy sector, which is similar to that in the current 2003 National Energy Policy. The 2015 draft policy acknowledges that the management and development of energy resources requires the effective participation of men and women in decision-making and accordingly, includes a policy objective to promote and support gender-related activities in the energy sector. It includes policy statements towards the achievement of this objective such as the promotion of gender equality within energy sub-sectors on the demand and supply sides, equitable gender participation in the formulation and implementation of energy interventions, training on appropriate technologies, and enhanced gender considerations in energy planning. Innovatively, from an energy policy perspective, it indicates that the government shall create awareness on "cultural structures and practices hindering access by both men and women to alternative sources of energy."

The Natural Gas Policy 2013 also contains a section on gender mainstreaming, although the section is poorly drafted. It is included in a section on gender mainstreaming and HIV & AIDS. The conflation of these two completely separate issues, particularly in the context of energy, is confusing and implies a lack of understanding of gender mainstreaming or commitment to its application.

Concerning both policies highlighted above, more meaningful policy statements could have been made by integrating gender into other sections of the policy. The policies are otherwise gender neutral in their assumption that energy policies benefit men and women equally. For example, the NEP contains a section on local content and national participation, and the Natural Gas Policy contains a similar section on local content and capacity building. For these policies to be more gender sensitive, the respective sections should include specific measures to increase women's participation in energy planning and development and build their capacity at all levels of the value chain. Furthermore, the sections on M&E in each policy should refer to the need for sex-disaggregated data.

While the above policy considerations with respect to gender mainstreaming in the energy sector are relevant, political will and institutional capacity are required to implement them, including the capacity to mainstream gender in the energy sector.

4. DONOR ASSISTANCE TO TANZANIA

Several donors are active in Tanzania's power sector and cooperate in a Development Partners Group (DPG) formed more than ten years ago. The DPG has been working with the GoT and other local stakeholders to strengthen development partnerships and the effectiveness of this joint development cooperation. The DPG consists of mostly bilateral development agencies and some multilateral ones, as indicated in Table 7. A new partner that is not a member of the DPG is China.

TABLE 7: DONORS ACTIVE IN TANZANIA

Institution	Grant	Tech. Assist.	Loan/credit
AfDB	No	Yes	Yes
CIDA, Canada	Yes	Yes	No
DFID, UK	Yes	Yes	No
EU	Yes	No	No
Finland	No	No	Yes
GIZ, Germany	Yes	Yes	Yes
KfW, Germany	Yes	Yes	Yes
JICA, Japan	Yes	Yes	Yes
EDCF, Korea	No	No	Yes
MCC, USA	Yes	Yes	No
SNV, Netherlands	Yes	Yes	No
NORAD, Norway	Yes	Yes	No
SIDA, Sweden	Yes	Yes	Yes
USAID, USA	Yes	Yes	No
UN	Yes	Yes	Yes
World Bank	Yes	Yes	Yes

Source: Based on Energy DPG Project Matrix, September 2014.

The Energy DPG Secretariat manages and updates its matrix quarterly, circulates it to energy DPs, and publishes it a month prior to the annual Joint Energy Sector Review in October. The Joint Energy Sector Review (JESR) is a strategic element for coordination, planning and financing of the energy sector. The MEM, in cooperation with the DPs, has been supporting and facilitating JESRs since 2007. The JESR established a common basis for monitoring performance and helping set priorities for the energy sector.

According to a report by the AfDB,[8] aid to Tanzania's energy sector has increased substantially during the last ten years, reaching about USD 1.5 billion in commitments between 2003 and 2012. Aid increased after 2007 and has been mainly focused on improving transmission and distribution infrastructure (76%) and the energy policy and regulatory framework (13%). The development partners (DPs) are expected to continue to prominently support the expected rapid expansion of the Tanzania energy sector while encouraging an increasingly transparent operating environment.

A funding gap explicitly identified in the National Rural Electrification Prospectus is associated with the medium- and long-term implementation of Phase II and III projects. This financing scenario,

[8] African Development Bank, *Renewable Energy in Africa – Tanzania Country Profile*, 2015.

identifying a gap of about USD 123 million (Table 8), does not take into consideration contributions from the GoT budget and TANESCO. The report notes that the GoT is expected to continue supporting electrification but its contributions are not in the form of firm commitments and will be made on an as-needed basis. It is further reported that GoT annual contributions of about USD 30 million are plausible, but even considering that, a large gap still remains.

TABLE 8: FUNDING GAP

	Urban	Rural	Total
	(Million US$ per year at 2013 prices)		
I. Average annual cost in period 2013 - 2022	168	247	415
II. Average annual urban and "REA Cost"	126	289	415
III. Contribution of:			
- End-User (connection fees under present system)	36	54	89
- Levies injected into REF		85	85
- Donors - Contributions to REF		50	50
- Donors - Project approach		60	60
- Private Sector (off-grid and distributed technologies)		8	8
"Gap" (II - III)	**90**	**32**	**123**

Comments:

c) Costs include all costs except for financing costs and inflation

"REA Cost": all costs of densification in settlements which are electrified from 2013 onward allocated to rural. Urban costs reflect the costs of densification in settlements which were already electrified by end of 2012.

Source: Innovation Energie Développement (financed by NORAD), *National Electrification Program Prospectus - Final Version,* 2014.

5. RECOMMENDED POLICY INTERVENTIONS FOR INCREASING INVESTMENT AND ACCESS

5.1 ENERGY POLICIES

A high priority policy intervention is completion and approval of the updated National Energy Policy. This should include a clear statement that all future generation should be procured through international competitive bidding. It should also clarify whether IPPs are allowed outside a PPP scheme with TANESCO as a partner. Other key areas where updated policies are required include subsidies, tariffs, TANESCO turnaround/reform, and geothermal development.

The importance of a clear subsidy policy is well recognized by MEM, Tanzania's DPs, and other stakeholders. The formulation of an energy subsidy policy is one of the key performance indicators for MEM within the Big Results Now Initiative.

Another important policy intervention is the development of a renewable energy policy that explicitly sets guidelines and targets. The Draft National Energy Policy contains some policy statements, but further development is needed.

The creation of a national energy efficiency policy is also missing and should be developed to serve as the framework under which some ongoing individual efforts, such as a light bulb exchange program in some regions, have been discussed.

An additional intervention is associated with the need to develop and finalize the national biomass energy policy and strategy.

To address the concern of fragmented legal and regulatory framework and overlapping institutional issues, a well-focused initiative should be carried out to harmonize the National Energy Plan with other national and sectoral plans, policies and legislation, including an institutional assessment of the roles and responsibilities found in their mandates and the actual practices. This is particularly needed in the areas of energy sector planning and power generation procurement (MEM, TANESCO and EWURA), and improved rural expansion coordination (TANESCO and REA).

5.2 ENERGY LAWS

An important action item in terms of the legal framework is associated with the need to develop the geothermal law, which was initiated by the National Geothermal Task Force, but no progress has been reported publicly. However, in December 2014, the GoT created the Tanzania Geothermal Development Company (TGDC) as a subsidiary of TANESCO. The initial focus of the TGDC has been on developing its strategic plan, staffing, and establishing collaboration with Kenya's Geothermal Development Corporation.

5.3 ENERGY REGULATORY FRAMEWORK AND TARIFFS

The key development issues in the regulatory space are related to the current and future performance of EWURA. There is a need to:

- Reconcile views on cost-reflective tariffs among EWURA, TANESCO and other stakeholders
- Improve EWURA's capabilities to carry out its current responsibilities
- Introduce new capabilities in response to requirements introduced by the unbundling of the sector according to the Sector Reform Plan and Roadmap.

Some of these actions will most likely require revisions/updates of existing regulations with, for example, possible follow-on work on the recently issued model PPA contracts, improved monitoring of procurement, unbundled sector tariff procedures, grid code development and eventually, market competition monitoring.

Another key area to be addressed is the lack of incentives for private micro-grid owners. In this regard, EWURA should establish a policy of compensation to the micro-grid owner for unamortized assets if the micro-grid is integrated into the grid and establish detailed procedures for addressing investor risk if areas with isolated mini-grids are electrified by the grid sooner than expected in long-term plans published or announced by the Rural Electrification Agency (REA).

5.4 POWER SECTOR DEVELOPMENT PLANS/INTEGRATED RESOURCE PLANS/GENERATION MASTER PLANS

A key intervention is related to the ongoing integrated resource planning effort, which should be completed, disseminated and established as the preferred approach moving forward.

An integral part of this planning approach is the PSMP, which should also be improved to include a system-wide expansion of the power system by taking into account conventional generation, geothermal and other renewable options as well as transmission system constraints. We understand that the process of developing the next PSMP has already started, but it might be possible to explore whether these additional dimensions are being considered or if it is possible for them to be included.

The GoT is heavily dependent on external consultants to generate development plans, which quickly become outdated. Thus, there is a need to build local capacity to carry out more effective planning. This is not a simple task, particularly considering TANESCO's transitional state under the unbundling process and as the new ISO/TSO takes on the planning role mandated in the Electricity Act.

The finalization of the Natural Gas Utilization Master Plan is important for the future successful utilization of off-shore gas reserves. A Draft National Gas Utilization Master Plan was prepared in 2014 by MEM and is still awaiting final adoption.

5.5 POWER GENERATION PROCUREMENT FRAMEWORK AND PROCESSES

Now that EWURA has officially published the "Model Power Purchase Agreements" for projects larger than 10 MW (including hydro, natural gas, oil, coal, geothermal, wind and solar), and the Rules on Initiation of Power Procurement, an action item is for EWURA to track and monitor how effective

these have been and to identify if any areas of improvement are needed in the model PPAs or procurement process.

A key challenge is to develop the institutional capacity and systems to run effective international competitive tenders. As progress is made in unbundling TANESCO, the Electricity Infrastructure Procurement Coordinator (EIPC) will need to be established and capacitated. The transition towards the competitive procurement of power sector projects should be monitored to ensure it is fully embraced and implemented.

Under the new procurement approach, all new IPPs are developed as PPPs with TANESCO as a partner. Considering TANESCO's precarious financial situation, this approach could further exacerbate TANESCO's financial shortfalls and undermine the benefits of parallel efforts to make TANESCO a profitable utility within the next two years.

Under this PPP framework, it appears that the GoT's previously stated commitments to contracting with IPPs may now be undermined by the greater drive to encourage only joint investment in public infrastructure projects with TANESCO as an owner, or joint owner of the assets. The goal of attracting private capital into power generation may be compromised with IPPs unwilling to invest in these circumstances.

To address the lack of clarity in the regulatory framework for small power producers (SPPs), it is recommended that regulations associated with land access, environmental permission and water use be passed for SPPs.

5.6 ELECTRIFICATION TARGETS, PLANNING AND EXECUTION (FOR GRID AND OFF-GRID)

The GoT must improve the planning and execution of rural electrification by issuing an official statement directing TANESCO and the REA to fully adopt the methodology and approach included in the Prospectus, and evaluating what additional tools and technical assistance are required to carry out the program.

The GoT also needs to address the high transaction costs of compliance, particularly environmental compliance. The GoT needs to streamline and have transparent processes for project development by amongst others, assessing the extent to which the requirements of each necessary permit/license can be reduced.

5.7 GENDER EQUALITY AND FEMALE EMPOWERMENT

Increased gender equality and women's empowerment in the energy sector is increasingly attractive to private investment and is smart economics. The policy provisions highlighted in Section 4 focused on gender mainstreaming in the energy sector and promoting women's participation.

Gender mainstreaming, while often prescribed in policy, is commonly not understood by those tasked with applying gender mainstreaming as a strategy for gender equality. Support for capacity building for gender mainstreaming, and to increase the understanding of policy makers and implementers of gender and energy regarding the necessity of women's participation in planning and decision-making is an important intervention.

6. RECOMMENDED TECHNICAL ASSISTANCE FOR INCREASING INVESTMENT AND ASSESS

TABLE 9 : RECOMMENDED TECHNICAL ASSISTANCE
To Enable or Increase Private Sector Investment in Cleaner Power Generation and Widened Access to Electricity

Policy Intervention	Technical Assistance	Active Donors in this Space*	Donor(s) Recommended to Provide Support**
Enhancement and completion of updated Nation Energy Policy to respond to these barriers and gaps and, where appropriate development of subsidiary or subsector policies	Development of proposals and assistance for MEM to strengthen and complete National Energy Policy through more clarification of roles and responsibilities (particularly with regard to competitive procurement) and also more comprehensive treatment of subsidy policy, and large-scale renewable energy including geothermal. Or, where appropriate assistance to MEM in developing stand-alone subsidiary or sub-sector policy documents	SIDA GIZ MCC AfDB World Bank	SIDA GIZ
Issue complete national policy on subsidies to and within the electricity subsector	Conduct an assessment and draft appropriate national subsidy policy (perhaps as a separate document or as part of the new energy policy)	NORAD	NORAD
Issue renewable energy policy	Conduct an assessment and draft renewable energy development policy defining rules and guidelines, standards, compliance enforcement (perhaps as a separate document or as a part of the new energy policy)	EU UNDP USAID	GIZ USAID
Issue national biomass energy policy	Assess ongoing effort to draft and get approved an explicit policy on biomass and bio-fuel resources as energy resources (perhaps as a separate document or as a part of the new energy policy)	SIDA GIZ	SIDA GIZ

TABLE 9 : RECOMMENDED TECHNICAL ASSISTANCE

To Enable or Increase Private Sector Investment in Cleaner Power Generation and Widened Access to Electricity

Policy Intervention	Technical Assistance	Active Donors in this Space*	Donor(s) Recommended to Provide Support**
Issue complete national energy efficiency policy to identify opportunities for overall energy efficiency gains, demand-side management, and peak load optimization	Carry out a detailed assessment and draft appropriate national energy efficiency policy	EU GIZ	EU GIZ
Draft national law on geothermal exploration and development	Assist GoT and National Geothermal Task Force to draft national geothermal law	GIZ DFID	DFID USAID
Strengthen capacity in EWURA in economic regulation	Assistance to EWURA and TANESCO to reconcile views on cost-reflective tariffs Assistance to EWURA to strengthen its economic regulatory capabilities in response to requirements introduced by the unbundling of the sector according to the Sector Reform Plan and Roadmap	SIDA USAID	USAID
EWURA should establish a policy of compensation to the micro-grid owner for unamortized assets if the micro-grid is integrated into the grid and establish detailed procedures for addressing investor risk if areas with isolated mini-grids are electrified by the grid sooner than expected in long-term plans published or announced by the REA	Regulator support in establishing policies and technical standards for micro-grids for their future integration into the grid	DFID USAID	USAID

TABLE 9 : RECOMMENDED TECHNICAL ASSISTANCE

To Enable or Increase Private Sector Investment in Cleaner Power Generation and Widened Access to Electricity

Policy Intervention	Technical Assistance	Active Donors in this Space*	Donor(s) Recommended to Provide Support**
Institutionalize integrated resource planning as the main energy sector approach using a revamped power sector master plan	Ensure that the ongoing integrated resource planning effort is completed, disseminated and established as the approach moving forward Gather and organize sector data and put in place the systems needed to support integrated resource planning Conduct capacity building activities	EU USAID JICA MCC?	USAID JICA
Reduce GoT practice of entertaining unsolicited proposals Enforce practice that all solicited and unsolicited bids to go through a competitive bidding process	Capacitate the Electricity Infrastructure Procurement Coordinators (EIPC) and assistance in developing procurement systems and standard documentation and contracts Review EWURA's Initiation of Power Procurement Rules and Standard PPAs to check whether they adequately support competitive procurement Evaluate whether PPP regulations issued by the PPP Centre under the Public Private Partnership Act of 2014 inhibit effective IPP competitive bidding (by being too restrictive and cumbersome) and whether the requirement for state participation and TANESCO ownership could be waived	EU GIZ	GIZ World Bank
Establish regulations for SPPs associated with land access, environmental permission and water use	Assessment of technical assistance needs, particularly at the environmental regulator and water basin authorities	None Identified	USAID

TABLE 9 : RECOMMENDED TECHNICAL ASSISTANCE

To Enable or Increase Private Sector Investment in Cleaner Power Generation and Widened Access to Electricity

Policy Intervention	Technical Assistance	Active Donors in this Space*	Donor(s) Recommended to Provide Support**
Establish a payment security mechanism at TANESCO for off-grid SPPs	Conduct an assessment of the proposed payment mechanism	World Bank	World Bank
Scale up project development through a bundled development approach	Support the Transaction Advisory Services Facility (TASF) overseen by REA, which is being set up with the support of the World Bank	World Bank	World Bank
Gender mainstreaming capacity building (government partners) and promotion of women's participation in training and development activities	Gender mainstreaming workshop(s), resources and promotion of women in the sector through the Women in African Power Network	AfDB	AfDB

* Based on EDPG project matrix, September 2014. Verification/update with EDPG needed.

** Recommended based on understanding of donor interest and prior focused areas. Further analysis of donor development agenda needed.

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APPENDIX A: RECOMMENDED POLICY INTERVENTIONS FOR TRANSACTIONS

RECOMMENDED POLICY INTERVENTIONS BASED ON CURRENT TRANSACTIONS[9] **To Enable or Increase Private Sector Investment in Cleaner Power Generation and Widen Access to Electricity**		
Policy and Regulatory Barriers to Transaction(s)	Recommended Intervention(s) and Effects	Technical Assistance Provided/Needed
Regulatory barriers, gaps and burdens	Reducing compliance burden for SPP developers: It is clear that developers of off-grid projects must comply with a large number of rules and regulations, and obtain many licenses and permissions.	It is recommended that an assessment be made on the extent to which the requirements of each necessary permission/license can be reduced by working with the permitting agencies.
Financial barriers and gaps	Small power project developers have been unable to get their projects implemented, partly due to the lack of access to affordable equity and debt finance. Typically, it is difficult to obtain debt finance with low levels of equity.	It is essential that there be smooth, workable channels by which private equity investments can flow into small, renewable power projects on terms acceptable to the investors as well as the local owners of the renewable resource.
Skills/scale barriers and gaps	Some of the local resource owners/controllers who are interested in developing their resources do not have any experience with any type of investment projects. They also lack adequate experience and skills to develop, commission, and operate power generation and distribution projects. The desirable alternative is to aggregate the projects to take advantage of economies of scale.	Support the TASF, overseen by REA, which is being set up with the support of the World Bank.

[9] Note this analysis applies only to small-scale projects.